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turn out to be only a subspecies of *chilensis* seems to be indicated by a series of specimens in my collection taken by the Yale Expedition at Urubamba, Peru (9,500 ft.). These are intermediate between typical specimens of *chilensis* from Valparaíso in the breadth of the pronotum, and are much more pilose, with the pubescence on the gaster of a brilliant orange brown color.

THE NYMPH OF OPHIOGOMPHUS JOHANNUS NEEDHAM.

BY LEWIS B. WOODRUFF,

NEW YORK.

Of the seven recognized species of *Ophiogomphus* occurring in northeastern North America, the nymphs of the three following species are still undescribed: *O. anomalus*, Harvey, *O. mainensis*, Packard, and *O. johannus* Needham. As it has been my good fortune to observe the latter in the process of transformation on more than one occasion, the description of its nymph is now available. This species is by no means rare locally along the stony brooks in the hills of northwestern Connecticut, on the occasional sandy bottoms of which they apparently pass their larval existence. Toward the end of May they crawl out at such points, that is where the margin is sandy, there to await the splitting of the thoracic dorsum. This occurs on the ground at not more than three or four feet from the brook's edge, and often, if not invariably, several hours after sunrise.

The following description of the male nymph of this species is made from very perfect exuviae taken at Litchfield, Conn., May 31, 1909, and preserved with the emerged imago:

Total length 26 mm.; of abdomen 16 mm.; of hind femur 4.5 mm. Width of head 5 mm.; of abdomen at 5th segment 6.5 mm.

Legs, genæ, sides of antennæ and lateral margins of abdomen sparsely hairy.

Color olivaceous, mottled with yellowish and fuscous; wing cases variegated with pale and dark markings; femora and tibiæ with broad pale bands just before the apices; a quadrate yellowish spot on each lateral dorsum of abdominal segments two to nine inclusive, in each of which are four round

or oval dark orbiculars enclosing yellow centers, except on the ninth, where there are but two of such orbiculars; a pair of small blackish spots in the depressions at the anterior base of the dorsal hooks on segments two to eight inclusive, midway between each of which and the quadrate dorso-lateral spot is another small dark maculation.

Antennæ with second joint slightly smaller than first; third spatulate, flattened, four or five times as long and more than twice as broad as second; fourth rudimentary.

Mentum of labium but little longer than its apical width (3.5×3 mm.), widened beyond basal third with upturned edges as in *O. aspersus*; median lobe rounded, edged with beading of rectangular castaneous denticles, within which is a fringe of long, flat, white scales; lateral lobes narrow, incurved, with a slender movable hook castaneous at tip and bearing dense yellowish setæ on its outer edge; the apex of the lobe is a blunt point without terminal hook, its internal margin with a row of about twelve low, rather blunt, teeth.

Abdomen elongate-oval in outline, widest at fifth segment, not abruptly narrowed on ninth segment; dorsum of tenth segment one-third shorter than ninth; lateral abdominal appendages two-thirds as long as the others, the dorsal and ventral abdominal appendages being equal in length with their tips blackish; lateral spines present on segments seven to nine increasing in length caudad, but on ninth not longer than one-half the length of dorsum of tenth; dorsal hooks on segments two to nine, erect and blunt anteriorly, posteriorly becoming more and more directed caudad, on the ninth almost attaining the form of a spine, and as in *O. aspersus* each surmounting a low transverse ridge; anterior two-thirds of each segment, including the ridge, with thick dark granulations, posterior one-third shining and smooth.

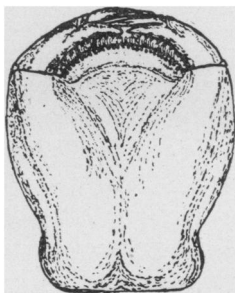
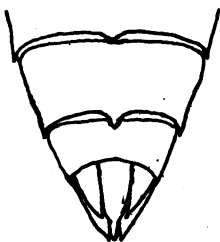
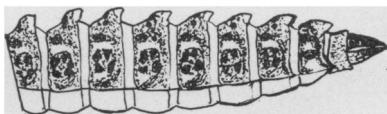
Burrowing hooks on fore and middle tibiæ strong.

The nymph of this species has been compared with alcoholic specimens of *O. aspersus* Morse, and *O. carolus* Needham, and differs from them in the following particulars:

In dorsal aspect it is much more slender in outline than either, the ninth segment of abdomen is not abruptly narrowed, and the lateral spines are decidedly shorter and smaller. In coloration it is darker, and the maculation, though of same general pattern, much more pronounced. From *O. carolus* it differs further in its more conical, less slender, lateral abdominal appendages; the longer dorsum of tenth abdominal segment; much larger and more prominent dorsal hooks; and slightly more slender and darker lateral lobes of labium. Compared with *O. aspersus*, its lateral abdominal appendages are shorter, those of *aspersus* being very slender and fully three-fourths as long as the dorsal appendage; the granulation of abdominal segments is much coarser; dorsal hooks slightly more pronounced; apex of lateral

lobes of labium more slender and less blunt; femora and tibiae stouter; throughout much less hairy; and third joint of antennae conspicuously different, being much broader and slightly shorter, that of *aspersus* being scarcely wider than first joint. By this character it may easily be distinguished from the latter.

Appended hereto are line drawings of the nymph above described, its abdomen in lateral aspect, its terminal joints and appendages viewed from above, and its labium including mentum.



To Dr. James G. Needham, the describer of the imago of this species, I would make due acknowledgment for his courtesy and generosity in supplying me with the above specimens of *O. aspersus* and *O. carolus* for purposes of comparison.